Safety Data Sheet
acc. to OSHA HCS

Printing date 12/28/2023 *Reviewed on 12/28/2023*

1 Identification

· **Product identifier**

· **Product Name: ICP-MS Spike Sample 4**

· **Part Name:** CL-SPIKE-4
· **Application of the substance / the mixture** For Laboratory Use Only
· **Uses advised against** Not for Human or Animal Use

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Spex CertiPrep, LLC.
203 Norcross Ave, Metuchen,
NJ 08840 USA
732-549-7144
USMet-CRMSales@antylia.com

· **Information department:** product safety department
· **Emergency telephone number:**
Emergency Phone Number (24 hours)
CHEMTREC (800-424-9300)
Outside US: 703-527-3887

2 Hazard(s) identification

· **Classification of the substance or mixture**

GHS05 Corrosion

Skin Corrosion 1B H314 Causes severe skin burns and eye damage.
Eye Damage 1 H318 Causes serious eye damage.

· **Label elements**
· **GHS label elements** The product is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms**

GHS05

· **Signal word** Danger

· **Hazard-determining components of labeling:**
nitric acid
· **Hazard statements**
H314 Causes severe skin burns and eye damage.
· **Precautionary statements**

P260	Do not breathe dusts or mists.
P264	Wash thoroughly after handling.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P301+P330+P331	If swallowed: Rinse mouth. Do NOT induce vomiting.
P303+P361+P353	If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338	If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a poison center/doctor.
P321	Specific treatment (see on this label).
P363	Wash contaminated clothing before reuse.
P405	Store locked up.
P501	Dispose of contents/container in accordance with local/regional/national/international regulations.

· **Classification system:**
· **NFPA ratings (scale 0 - 4)**

Health = 3
Fire = 0
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**

Health = 3
Fire = 0
Reactivity = 0

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· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterization: Mixtures**
· **Description:** Mixture of the substances listed below with nonhazardous additions.

· **Dangerous components:**		
7697-37-2	nitric acid	5.0%
7664-39-3	hydrofluoric acid	0.2%

· **Chemical identification of the substance/preparation**		
7732-18-5	water, distilled, conductivity or of similar purity	94.7108%
7429-90-5	aluminium	0.02%
7440-39-3	barium	0.02%
7439-89-6	iron	0.01%
87-69-4	(+)-tartaric acid	0.006%
7439-96-5	manganese	0.005%
7440-02-0	nickel	0.005%
7440-48-4	cobalt	0.005%
7440-62-2	vanadium	0.005%
7440-66-6	zinc	0.005%
7440-50-8	copper	0.0025%
7440-47-3	chromium	0.002%
7440-36-0	antimony	0.001%
7440-22-4	silver	0.0005%
7440-28-0	thallium	0.0005%
7440-41-7	Beryllium from Beryllium Acetate	0.0005%
7440-43-9	cadmium	0.0005%
7440-38-2	arsenic	0.0004%
7439-92-1	lead	0.0002%
7782-49-2	selenium	0.0001%

4 First-aid measures

· **Description of first aid measures**
· **General information:** Immediately remove any clothing soiled by the product.
· **After inhalation:** Supply fresh air; consult doctor in case of complaints.
· **After skin contact:** Immediately rinse with water.
· **After eye contact:** Rinse opened eye for several minutes under running water. Then consult a doctor.
· **After swallowing:** Do not give anything to eat or drink - Do not induce vomitting
· **Information for Doctor:**
· **Most important symptoms and effects, both acute and delayed** No further relevant information available.
· **Indication of any immediate medical attention and special treatment needed** No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:** Use fire fighting measures that suit the environment.
· **Special hazards arising from the substance or mixture** During heating or in case of fire poisonous gases are produced.
· **Advice for firefighters**
· **Protective equipment:** Mouth respiratory protective device.

6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures**
Mount respiratory protective device.
Wear protective equipment. Keep unprotected persons away.
· **Environmental precautions:**
Dilute with plenty of water.
Do not allow to enter sewers/ surface or ground water.

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· **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Use neutralizing agent.
Dispose contaminated material as waste according to section 13.
Ensure adequate ventilation.
· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.
· **Protective Action Criteria for Chemicals**

· **PAC-1:**		
7697-37-2	nitric acid	0.16 ppm
7664-39-3	hydrofluoric acid	1.0 ppm
7440-39-3	barium	1.5 mg/m³
7439-89-6	iron	3.2 mg/m³
87-69-4	(+)-tartaric acid	1.6 mg/m³
7439-96-5	manganese	3 mg/m³
7440-02-0	nickel	4.5 mg/m³
7440-48-4	cobalt	0.18 mg/m³
7440-62-2	vanadium	3 mg/m³
7440-66-6	zinc	6 mg/m³
7440-50-8	copper	3 mg/m³
7440-47-3	chromium	1.5 mg/m³
7440-36-0	antimony	1.5 mg/m³
7440-22-4	silver	0.3 mg/m³
7440-28-0	thallium	0.06 mg/m³
7440-41-7	Beryllium from Beryllium Acetate	0.0023 mg/m³
7440-43-9	cadmium	0.10 mg/m³
7440-38-2	arsenic	1.5 mg/m³
7439-92-1	lead	0.15 mg/m³
7782-49-2	selenium	0.6 mg/m³

· **PAC-2:**		
7697-37-2	nitric acid	24 ppm
7664-39-3	hydrofluoric acid	24 ppm
7440-39-3	barium	180 mg/m³
7439-89-6	iron	35 mg/m³
87-69-4	(+)-tartaric acid	17 mg/m³
7439-96-5	manganese	5 mg/m³
7440-02-0	nickel	50 mg/m³
7440-48-4	cobalt	2 mg/m³
7440-62-2	vanadium	5.8 mg/m³
7440-66-6	zinc	21 mg/m³
7440-50-8	copper	33 mg/m³
7440-47-3	chromium	17 mg/m³
7440-36-0	antimony	13 mg/m³
7440-22-4	silver	170 mg/m³
7440-28-0	thallium	3.3 mg/m³
7440-41-7	Beryllium from Beryllium Acetate	0.025 mg/m³
7440-43-9	cadmium	0.76 mg/m³
7440-38-2	arsenic	17 mg/m³
7439-92-1	lead	120 mg/m³
7782-49-2	selenium	6.6 mg/m³

· **PAC-3:**		
7697-37-2	nitric acid	92 ppm
7664-39-3	hydrofluoric acid	44 ppm
7440-39-3	barium	1,100 mg/m³
7439-89-6	iron	150 mg/m³
87-69-4	(+)-tartaric acid	100 mg/m³

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7439-96-5	manganese	1,800 mg/m³
7440-02-0	nickel	99 mg/m³
7440-48-4	cobalt	20 mg/m³
7440-62-2	vanadium	35 mg/m³
7440-66-6	zinc	120 mg/m³
7440-50-8	copper	200 mg/m³
7440-47-3	chromium	99 mg/m³
7440-36-0	antimony	80 mg/m³
7440-22-4	silver	990 mg/m³
7440-28-0	thallium	20 mg/m³
7440-41-7	Beryllium from Beryllium Acetate	0.1 mg/m³
7440-43-9	cadmium	4.7 mg/m³
7440-38-2	arsenic	100 mg/m³
7439-92-1	lead	700 mg/m³
7782-49-2	selenium	40 mg/m³

7 Handling and storage

· **Handling:**
· **Precautions for safe handling**
Ensure good ventilation/exhaustion at the workplace.
Prevent formation of aerosols.
· **Information about protection against explosions and fires:** Keep respiratory protective device available.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:** No special requirements.
· **Information about storage in one common storage facility:** Not required.
· **Further information about storage conditions:** Keep receptacle tightly sealed.
· **Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see section 7.

· **Control parameters**
· **Components with limit values that require monitoring at the workplace:**
The following constituent is the only constituent of the product which has a PEL, TLV or other recommended exposure limit.
At this time, the remaining constituent has no known exposure limits.

7664-39-3 hydrofluoric acid	
PEL	Long-term value: 1* mg/m³, 3 ppm as F, *sulfuric acid
REL	Long-term value: 2.5 mg/m³, 3 ppm Ceiling limit value: 5* mg/m³, 6* ppm *15-min, as F
TLV	Long-term value: 0.5 ppm Ceiling limit value: 2 ppm as F; Skin, BEI

· **Ingredients with biological limit values:**

7664-39-3 hydrofluoric acid	
BEI	3 mg/g creatinine Medium: urine Time: prior to shift Parameter: Fluorides (background, nonspecific) 10 mg/g creatinine Medium: urine Time: end of shift Parameter: Fluorides (background, nonspecific)

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.

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Product Name: ICP-MS Spike Sample 4

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Wash hands before breaks and at the end of work.
Avoid contact with the eyes.
Avoid contact with the eyes and skin.

· ***Respiratory protection:***
In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

· ***Protection of hands:***

Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

· ***Material of gloves***
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

· ***Penetration time of glove material*** *The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.*

· ***Eye protection:***

Tightly sealed goggles

9 Physical and chemical properties

· ***Information on basic physical and chemical properties***	
· ***General Information***	
· ***Appearance:***	
Form:	*Liquid*
Color:	*According to product specification*
· ***Odor:***	*Characteristic*
· ***Odour Threshold:***	*Not applicable.*
· ***pH-value:***	*Not applicable.*
· ***Change in condition***	
Melting point/Melting range:	*Undetermined.*
Boiling point/Boiling range:	*83 °C (181.4 °F)*
· ***Flash point:***	*Not applicable.*
· ***Flammability (solid, gaseous):***	*Not applicable.*
· ***Decomposition temperature:***	*Not applicable.*
· ***Ignition temperature:***	*Product is not selfigniting.*
· ***Danger of explosion:***	*Product does not present an explosion hazard.*
· ***Explosion limits:***	
Lower:	*Not applicable.*
Upper:	*Not applicable.*
· ***Vapor pressure at 20 °C (68 °F):***	*23 hPa (17.3 mm Hg)*
· ***Density***	*Not applicable.*
· ***Relative density***	*Not applicable.*
· ***Vapor density***	*Not applicable.*
· ***Evaporation rate***	*Not applicable.*
· ***Solubility in / Miscibility with***	
Water:	*Fully miscible.*
· ***Partition coefficient (n-octanol/water):***	*Not applicable.*
· ***Viscosity:***	
Dynamic:	*Not applicable.*
Kinematic:	*Not applicable.*
· ***Solvent content:***	
Water:	*94.7 %*

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VOC content:	0.00 %
Solids content:	0.1 %
· **Other information**	No further relevant information available.

10 Stability and reactivity

· **Reactivity** No further relevant information available.
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Possibility of hazardous reactions** No dangerous reactions known.
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:** No dangerous decomposition products known.

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**		
7697-37-2 nitric acid		
Inhalative	LC50/4 h	2.65 mg/l (ATE)

· **Primary irritant effect:**
· **on the skin:** Caustic effect on skin and mucous membranes.
· **on the eye:**
Strong caustic effect.
Strong irritant with the danger of severe eye injury.
· **Sensitization:** No sensitizing effects known.
· **Additional toxicological information:**
The product shows the following dangers according to internally approved calculation methods for preparations:
Corrosive
Irritant

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**		
7440-02-0	nickel	2B
7440-48-4	cobalt	2B
7440-47-3	chromium	3
7440-41-7	Beryllium from Beryllium Acetate	1
7440-43-9	cadmium	1
7440-38-2	arsenic	1
7439-92-1	lead	2B
7782-49-2	selenium	3

· **NTP (National Toxicology Program)**		
7440-02-0	nickel	R
7440-48-4	cobalt	R
7440-41-7	Beryllium from Beryllium Acetate	K
7440-43-9	cadmium	K
7440-38-2	arsenic	K
7439-92-1	lead	R

· **OSHA-Ca (Occupational Safety & Health Administration)**	
7440-43-9	cadmium
7440-38-2	arsenic

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.

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· **Additional ecological information:**
· **General notes:**
Water hazard class 2 (Self-assessment): hazardous for water
Do not allow product to reach ground water, water course or sewage system.
Must not reach bodies of water or drainage ditch undiluted or unneutralized.
Danger to drinking water if even small quantities leak into the ground.
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:** Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.
· **Recommended cleansing agent:** Water, if necessary with cleansing agents.

14 Transport information

· **UN-Number**	
· **DOT, ADR, IMDG, IATA**	UN3264
· **UN proper shipping name**	
· **DOT**	Corrosive liquid, acidic, inorganic, n.o.s. (Nitric acid)
· **ADR**	3264 CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (NITRIC ACID)
· **IMDG, IATA**	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (NITRIC ACID)
· **Transport hazard class(es)**	
· **DOT**	

· **Class**	8 Corrosive substances
· **Label**	8
· **ADR, IMDG, IATA**	

· **Class**	8 Corrosive substances
· **Label**	8
· **Packing group**	
· **DOT, ADR, IMDG, IATA**	III
· **Environmental hazards:**	Not applicable.
· **Special precautions for user**	Warning: Corrosive substances
· **Hazard identification number (Kemler code):**	80
· **EMS Number:**	F-A,S-B
· **Segregation groups**	(SGG1) Acids
· **Stowage Category**	A
· **Stowage Code**	SW2 Clear of living quarters.
· **Segregation Code**	SG36 Stow "separated from" SGG18-alkalis. SG49 Stow "separated from" SGG6-cyanides
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **Transport/Additional information:**	
· **ADR**	
· **Excepted quantities (EQ)**	Code: E1 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 1000 ml

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· **IMDG**	
· **Limited quantities (LQ)**	5L
· **Excepted quantities (EQ)**	Code: E1 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 1000 ml
· **UN "Model Regulation":**	UN 3264 CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (NITRIC ACID), 8, III

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture** No further relevant information available.
· **Sara**

· **Section 313 (Specific toxic chemical listings):**	
7697-37-2	nitric acid
7664-39-3	hydrofluoric acid
7429-90-5	aluminium
7440-39-3	barium
7439-96-5	manganese
7440-02-0	nickel
7440-48-4	cobalt
7440-62-2	vanadium
7440-66-6	zinc
7440-50-8	copper
7440-47-3	chromium
7440-36-0	antimony
7440-22-4	silver
7440-28-0	thallium
7440-41-7	Beryllium from Beryllium Acetate
7440-43-9	cadmium
7440-38-2	arsenic
7439-92-1	lead
7782-49-2	selenium

· **TSCA (Toxic Substances Control Act):**
All components have the value ACTIVE.

· **Hazardous Air Pollutants**	
7664-39-3	hydrofluoric acid
7439-96-5	manganese
7440-48-4	cobalt
7439-92-1	lead

· **Proposition 65**

· **Chemicals known to cause cancer:**	
7440-02-0	nickel
7440-48-4	cobalt
7440-41-7	Beryllium from Beryllium Acetate
7440-43-9	cadmium
7440-38-2	arsenic
7439-92-1	lead

· **Chemicals known to cause reproductive toxicity for females:**
None of the ingredients is listed.

· **Chemicals known to cause reproductive toxicity for males:**	
7440-43-9	cadmium

· **Chemicals known to cause developmental toxicity:**	
7440-43-9	cadmium

· **Carcinogenic categories**

· **EPA (Environmental Protection Agency)**		
7440-39-3	barium	D, CBD(inh), NL(oral)

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7439-96-5	manganese	D
7440-66-6	zinc	D, I, II
7440-50-8	copper	D
7440-22-4	silver	D
7440-41-7	Beryllium from Beryllium Acetate	B1, K/L(inh), CBD(oral)
7440-43-9	cadmium	B1
7440-38-2	arsenic	A
7439-92-1	lead	B2
7782-49-2	selenium	D

· **TLV (Threshold Limit Value)**

7429-90-5	aluminium	A4
7440-39-3	barium	A4
7440-02-0	nickel	A5
7440-48-4	cobalt	A3
7440-43-9	cadmium	A2
7440-38-2	arsenic	A1
7439-92-1	lead	A3

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**

7440-02-0	nickel
7440-43-9	cadmium
7440-38-2	arsenic

· **GHS label elements** The product is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms**

GHS05

· **Signal word** Danger

· **Hazard-determining components of labeling:**
nitric acid
· **Hazard statements**
H314 Causes severe skin burns and eye damage.
· **Precautionary statements**
P260 Do not breathe dusts or mists.
P264 Wash thoroughly after handling.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P301+P330+P331 If swallowed: Rinse mouth. Do NOT induce vomiting.
P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310 Immediately call a poison center/doctor.
P321 Specific treatment (see on this label).
P363 Wash contaminated clothing before reuse.
P405 Store locked up.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.
· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Department issuing SDS:** product safety department
· **Contact:**
Spex CertiPrep, LLC.
1-732-549-7144
· **Date of preparation / last revision** 12/28/2023
· **Abbreviations and acronyms:**
ADR: Accord relatif au transport international des marchandises dangereuses par route (European Agreement Concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)

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NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
VOC: Volatile Organic Compounds (USA, EU)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
BEI: Biological Exposure Limit
Skin Corrosion 1B: Skin corrosion/irritation – Category 1B
Eye Damage 1: Serious eye damage/eye irritation – Category 1